

HowTo Build a Meteohub USB Stick Image

The initial content of an Meteohub USB stick image is created by giving the "turnup" command on the SlugOS shell from the Meteohub firmware. These steps are described in the how-to about building a Meteohub firmware image.

This step by step instruction tells how to continue to create a Meteohub usb stick image that contains all open source components needed to make up an operating platform for the Meteohub application.

To use/distribute Meteohub USB stick images image you have to accept the SlugOS license terms as listed in Appendix 1.

Files/Packages needed to setup a Meteohub firmware image

1. SlugOS/BE 4.8 beta packages to be installed:

- bash - 3.2-r2 - An sh-compatible command language interpreter.
- binutils - 2.18-r1 - A GNU collection of binary utilities
- binutils-dev - 2.18-r1 - A GNU collection of binary utilities
- binutils-symlinks - 2.18-r1 - A GNU collection of binary utilities
- bzip2 - 1.0.2-r1 - Very high-quality data compression program.
- coreutils - 5.3.0-r2 - A collection of core GNU utilities.
- coreutils-doc - 5.3.0-r2 - A collection of core GNU utilities.
- cron - 3.0p11-r8 - Vixie cron.
- cron-dev - 3.0p11-r8 - Vixie cron.
- expat - 2.0.1-1 - XML Parser library
- fontconfig - 2.5.0-0 - Font configuration library
- fontconfig-utils - 2.4.1-r2 - A library for configuring and customizing font access.
- freetype - 2.1.10-4 - Free truetype library
- gcc - 4.1.2-r10 - The GNU cc and gcc C compilers.
- gcc-symlinks - 4.1.2-r10 - The GNU cc and gcc C compilers.
- gconv-modules - 2.2.5-7 - Provides gconv modules missing from the firmware. These are used by glibc's iconv() implementation.
- gd - 2.0.33-r1 - gd is a library used to create PNG, JPEG, or WBMP images.
- gd-dev - 2.0.33-r1 - gd is a library used to create PNG, JPEG, or WBMP images.
- glibc-charmap-utf-8 - 2.5-r8 - character map for utf-8 encoding
- glibc-dbg - 2.5-r8 - GNU C Library
- glibc-extra-nss - 2.5-r8 - glibc: nis, nisplus and hesiod search services
- glibc-localedata-de-de - 2.5-r8 - locale definition for de-de
- glibc-localedata-es-es - 2.5-r8 - locale definition for es-es
- glibc-localedata-fr-fr - 2.5-r8 - locale definition for fr-fr
- glibc-localedata-i18n - 2.5-r8 - locale definition for i18n
- glibc-localedata-iso14651-t1 - 2.5-r8 - locale definition for iso14651-t1
- glibc-localedata-it-it - 2.5-r8 - locale definition for it-it
- glibc-localedata-translit-circle - 2.5-r8 - locale definition for translit-circle
- glibc-localedata-translit-cjk-compat - 2.5-r8 - locale definition for translit-cjk-compat
- glibc-localedata-translit-combining - 2.5-r8 - locale definition for translit-combining
- glibc-localedata-translit-compat - 2.5-r8 - locale definition for translit-compat
- glibc-localedata-translit-font - 2.5-r8 - locale definition for translit-font

- glibc-localedata-translit-fraction - 2.5-r8 - locale definition for translit-fraction
- glibc-localedata-translit-narrow - 2.5-r8 - locale definition for translit-narrow
- glibc-localedata-translit-neutral - 2.5-r8 - locale definition for translit-neutral
- glibc-localedata-translit-small - 2.5-r8 - locale definition for translit-small
- glibc-localedata-translit-wide - 2.5-r8 - locale definition for translit-wide
- kernel-dev - 2.6.21.7+svnr927-r0 - Linux 2.6.x kernel for IXP4xx devices
- kernel-module-cp2101 - 2.6.21.7+svnr927-r0 - cp2101 kernel module; Silicon Labs CP2101/CP2102 RS232 serial adaptor driver
- kernel-module-exportfs - 2.6.21.7+svnr927-r0 - exportfs kernel module
- kernel-module-ftdi-sio - 2.6.21.7+svnr927-r0 - ftdi-sio kernel module; USB FTDI Serial Converters Driver
- kernel-module-hid - 2.6.21.7+svnr927-r0 - hid kernel module
- kernel-module-io-ti - 2.6.21.7+svnr927-r0 - io-ti kernel module; Edgeport USB Serial Driver
- kernel-module-ixp4xx-wdt - 2.6.21.7+svnr927-r0 - ixp4xx-wdt kernel module; IXP4xx Network Processor Watchdog
- kernel-module-lockd - 2.6.21.7+svnr927-r0 - lockd kernel module; NFS file locking service version 0.5.
- kernel-module-nfs - 2.6.21.7+svnr927-r0 - nfs kernel module
- kernel-module-nfsd - 2.6.21.7+svnr927-r0 - nfsd kernel module
- kernel-module-pl2303 - 2.6.21.7+svnr927-r0 - pl2303 kernel module; Prolific PL2303 USB to serial adaptor driver
- kernel-module-sunrpc - 2.6.21.7+svnr927-r0 - sunrpc kernel module
- kernel-module-ti-usb-3410-5052 - 2.6.21.7+svnr927-r0 - ti-usb-3410-5052 kernel module; TI USB 3410/5052 Serial Driver
- kernel-module-usbhid - 2.6.21.7+svnr927-r0 - usbhid kernel module; USB HID core driver
- kernel-module-usbserial - 2.6.21.7+svnr927-r0 - usbserial kernel module; USB Serial Driver core
- kernel-module-v4l1-compat - 2.6.21.7+svnr927-r0 - v4l1-compat kernel module; v4l(1) compatibility layer for v4l2 drivers.
- kernel-module-v4l2-common - 2.6.21.7+svnr927-r0 - v4l2-common kernel module; misc helper functions for v4l2 device drivers
- kernel-module-videodev - 2.6.21.7+svnr927-r0 - videodev kernel module; Device registrar for Video4Linux drivers v2
- libc6-dev - 2.5-r8 - GNU C Library
- libexpat-dev - 2.0.0-r2 - Jim Clarkes XML parser library.
- libexpat1 - 2.0.0-r2 - Jim Clarkes XML parser library.
- libfontconfig-dev - 2.4.1-r2 - A library for configuring and customizing font access.
- libfontconfig1 - 2.4.1-r2 - A library for configuring and customizing font access.
- libfreetype-dev - 2.3.5-r2 - Freetype font rendering library
- libfreetype6 - 2.3.5-r2 - Freetype font rendering library
- libgcc-s-dev - 4.1.2-r13 - The GNU cc and gcc C compilers.
- libgd - 2.0.35-2 - An ANSI C library for the dynamic creation of images
- libjpeg - 6b-2 - collection of jpeg tools
- libjpeg-dev - 6b-r7 - libjpeg is a library for handling the JPEG (JFIF) image format.
- libjpeg-tools - 6b-r7 - libjpeg is a library for handling the JPEG (JFIF) image format.
- libjpeg62 - 6b-r7 - libjpeg is a library for handling the JPEG (JFIF) image format.
- libperl5 - 5.8.8-r25 - Perl is a popular scripting language.
- libpng - 1.2.25-1 - Portable Network Graphics Libraries
- libpng-dev - 1.2.20-r0 - PNG Library
- libpng12-0 - 1.2.20-r0 - PNG Library
- libpng12-dev - 1.2.20-r0 - PNG Library
- libpng3 - 1.2.20-r0 - PNG Library
- libpopt0 - 1.7-r4 - The popt library exists essentially for parsing command

line options.

- libreadline4 - 4.3-r3 - The GNU Readline library provides a set of functions for use by applications that allow users to edit command lines as they are
- libssl0.9.7 - 0.9.7g-r5 - Secure Socket Layer (SSL) binary and related cryptographic tools.
- libstdc++-dev - 4.1.2-r10 - The GNU cc and gcc C compilers.
- libthread-db1 - 2.5-r8 - GNU C Library
- libusb-0.1-4 - 0.1.12-r1 - libusb is a library to provide userspace access to USB devices.
- libusb-0.1-dev - 0.1.12-r1 - libusb is a library to provide userspace access to USB devices.
- libusbpp-0.1-4 - 0.1.12-r1 - libusb is a library to provide userspace access to USB devices.
- libz-dbg - 1.2.3-r2 - Zlib Compression Library
- libz-dev - 1.2.3-r2 - Zlib Compression Library
- linux-libc-headers-dev - 2.6.20-r8 - Sanitized set of 2.6 kernel headers for the C library's use.
- locale-base-de-de - 2.5-r8 - GNU C Library
- locale-base-es-es - 2.5-r8 - GNU C Library
- locale-base-fr-fr - 2.5-r8 - GNU C Library
- locale-base-it-it - 2.5-r8 - GNU C Library
- localedef - 2.5-r8 - glibc: compile locale definition files
- make - 3.81-r0 - GNU Make examines the timestamps on a set of interdependent files, and, if necessary, issues commands to bring them up-to-date.
- make-dev - 3.81-r0 - GNU Make examines the timestamps on a set of interdependent files, and, if necessary, issues commands to bring them up-to-date.
- ncftp - 3.2.0-r0 - A sophisticated console ftp client
- ncurses - 5.4-r10 - Ncurses library
- ntp - 4.2.2p3-r1 - The Network Time Protocol (NTP) is used to synchronize the time of a computer client or server to another server or reference t
- ntp-tickadj - 4.2.2p3-r1 - The Network Time Protocol (NTP) is used to synchronize the time of a computer client or server to another server or reference t
- ntp-utils - 4.2.2p3-r1 - The Network Time Protocol (NTP) is used to synchronize the time of a computer client or server to another server or reference t
- openssl - 0.9.7g-r5 - Secure Socket Layer (SSL) binary and related cryptographic tools.
- openssl-dev - 0.9.7g-r5 - Secure Socket Layer (SSL) binary and related cryptographic tools.
- perl - 5.8.8-r25 - Perl is a popular scripting language.
- portmap - 6.0-r2 - RPC program number mapper.
- rsync - 2.6.9-r0 - A file-synchronization tool
- samba - 3.0.23c-r1 - Version 3.0.23c-r1 of package samba
- tar - 1.18-r0 - GNU tar saves many files together into a single tape or disk archive, and can restore individual files from the archive.
- thttpd - 2.25b-r6 - A simple, small, portable, fast, and secure HTTP server.
- tzdata - 2007e-r1 - Timezone data
- tzdata-africa - 2007e-r1 - Timezone data
- tzdata-america - 2007e-r1 - Timezone data
- tzdata-asia - 2007e-r1 - Timezone data
- tzdata-australia - 2007e-r1 - Timezone data
- tzdata-europe - 2007e-r1 - Timezone data
- tzdata-pacific - 2007e-r1 - Timezone data
- unrar - 3.4.3-r0 - Version 3.4.3-r0 of package unrar
- update-modules-dev - 1.0-r6 - Script to manage module configuration files
- update-rc.d-dev - 0.7-r1 - Manage symlinks in /etc/rcN.d
- vim - 7.0-r1 - Vim is an almost fully-compatible version of the Unix editor Vi.
- wget - 1.9.1-r7 - A console URL download utility featuring HTTP, FTP, and more.
- zlib - 1.2.3-2 - zlib is a library implementing the 'deflate' compression system.

2. Open Source Applications not available as an installable package, that have to be compiled from the sources:

- esmtp-0.6.0: <http://switch.dl.sourceforge.net/sourceforge/esmtp/esmtp-0.6.0.tar.bz2>
- fontconfig-2.4.2 (works better than ipkg package):
<http://www.fontconfig.org/release/fontconfig-2.4.2.tar.gz>
- freetype-2.3.5 (works better than ipkg package):
<http://download.savannah.gnu.org/releases/freetype/freetype-2.3.5.tar.gz>
- gd-2.0.35 (works better than ipkg package):
<http://www.libgd.org/releases/gd-2.0.35.tar.gz>
- gnuplot-4.2.0 (works better than ipkg package):
<http://www.mirrorservice.org/sites/download.sourceforge.net/pub/sourceforge/g/gn/gnuplot/gnuplot-4.2.0.tar.gz>
- libesmtp-1.0.4:
<http://www.stafford.uklinux.net/libesmtp/libesmtp-1.0.4.tar.bz2>
- libgcgi-0.9.5:
<http://catchen.org/gcgi/gcgi-0.9.5.tar.gz>
- zlib-1.2.3 (works better than ipkg release):
<http://www.zlib.net/zlib-1.2.3.tar.gz>

If one of the files/packages is not available under the given links, please drop an email to "info@meteohub.de" to get this fixed.

STEP 1:

When Meteohub system boots with an initial USB stick, there are just a very few linux packages installed. Fortunately, adding packages to a SlugOS operating system is very simple by means of an included package installer. To get the actual list of available packets into the installer give the command "ipkg update". "ipkg list" will give a lengthy list of packages available for installation, "ipkg list_installed" tells you what packages are already installed.

STEP 2:

Install all packages listed under (1) by "ipkg <package_name>". If you need the source code of one of these packages, you can easily access this at "<http://ipkgfind.nslu2-linux.org/>". Just type in the package name and you get information about the package including a link to the source code.

STEP 3:

A few open source programs needed to have a Meteohub application running are not available as a prepackaged download. These applications are listed at (2). For each application you have to download the source code and have to compile these yourself. As there is already a complete native compile environment on your Meteohub, you can do the compilation directly on the NSLU2. I recommend to store the source code in directory "/home". Each tar archive includes instructions how to compile. Normally it will be a "configure-make-install" cycle. Compilation will take some time.

STEP 4:

Having brought all needed open source applications to the USB stick, you have the open source operating environment Meteohub is working on. Things that differentiate this base system from a Meteohub System are

- config files, which are not copyrighted
- shell scripts, that are not copyrighted
- Meteohub application files, which are the sole copyright of the Meteohub author

If you need help in setting up config files and/or scripts in order to get your base system up and running, please contact "info@meteohub.de" for further assistance.

STEP 5:

To make a snapshot of the USB stick as is, shutdown the NSLU2, pull of the USB stick, an put it into a linux system. There you can make a raw data copy with the "dd" command.

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